

**Amendments to the Claims:**

*This listing of claims will replace all prior versions, and listings, of claims in the application:*

1-18 cancel

19. (New) A vehicle system controller for a vehicle comprising:  
a vehicle mode control portion;  
an output torque requestor control portion;  
a battery management control portion;  
a driver information control portion;  
an energy management control portion;  
a brake system control portion;  
an engine start/stop control portion; and  
a torque estimation control portion.

20. (New) The controller of claim 19 wherein the vehicle mode control portion determines an operating mode for the vehicle and communicates the operating mode of the vehicle to the other control portions so that the other control portions may function according to the current vehicle mode.

21. (New) The controller of claim 19 wherein the vehicle mode control portion determines faults prior to starting and stopping the vehicle and during vehicle operation in order to insure the other control portions respond to the fault before proceeding.

22. (New) The controller of claim 21 wherein the vehicle mode control portion selects a limited operating strategy ("LOS") mode with which to operate the remaining functional powertrain components or shuts down the vehicle when the fault is detected.

23. (New) The controller of claim 19 wherein the output torque requestor control portion receives and handles all torque commands from requesting devices within the vehicle and determines a final wheel torque (positive or negative) that powertrain and regenerative braking systems must produce.

24. (New) The controller of claim 23 wherein the output torque requestor control portion combines driver demands from accelerator and brake pedals and arbitrates requests from cruise control, traction control, interactive vehicle dynamics, and vehicle speed limiting systems when determining the final wheel torque.

25. (New) The controller of claim 23 wherein the output torque requestor control portion divides the final wheel torque between vehicle powertrain and brake assemblies and issues corresponding commands to an engine controller control, transaxle controller and brake controller.

26. (New) The controller of claim 21 wherein the battery management control portion interfaces with a battery controller and controls opening and closing of contactors in a battery pack based upon the vehicle mode signals received from portion.

27. (New) The controller of claim 21 wherein the battery management control portion reads and processes discharge/charge power limits from a battery controller and monitors a battery for faults and communicates this information to the other control portions.

28. (New) The controller of claim 19 wherein the driver information control portion receives signals from vehicle sensors and controllers and calculates vehicle operating data that is conveyed to the driver.

29. (New) The controller of claim 28 wherein the driver information control portion receives measured data associated with vehicle speed, battery state of charge, and

available battery power and uses algorithms to communicate signals representing this data to the instrument panel or other vehicle displays or data providing devices.

30. (New) The controller of claim 19 wherein the energy management control portion controls power flow between and engine, motor, generator, battery, and wheels.

31. (New) The controller of claim 19 wherein the brake system control portion implements regenerative braking control process of the vehicle as a function of whether regenerative braking is for series regenerative braking or for parallel regenerative braking.

32. (New) The controller of claim 31 wherein the brake system control portion control an engine, output shaft, planetary gear set, and drive train to utilize engine compression braking when regenerative braking is not available.

33. (New) The controller of claim 19 wherein the engine start/stop control portion coordinates timing and operation of the "startup" and "shutdown" of an engine of the vehicle.

34. (New) The controller of claim 19 wherein the engine start/stop control portion contains logical conditions used to decide whether to turn on/off the engine or, if already "on", whether to keep the engine "running".

35. (New) The controller of claim 19 wherein the engine start/stop control portion coordinates a process of engine startup among an engine controller and transaxle controller in order to minimize undesirable noise, vibrations, "harshness", and emissions.

36. (New) The controller of claim 19 wherein the torque estimation control portion estimates torque produced by an engine and transaxle.

37. (New) The controller of claim 36 wherein the torque estimation control portion receives torque estimates from an engine controller and transaxle controller and compares the engine controller estimate to the transaxle controller estimate such that if the estimates vary beyond a certain threshold value, the torque estimation control portion notifies the vehicle mode control portion of a potential fault condition.

38. (New) The controller of claim 19 wherein each control portion may be removed from the controller without disrupting operations of the other control portions.

39. (New) A vehicle system controller for a vehicle comprising:

- a vehicle mode control portion;
- an output torque requestor control portion;
- a battery management control portion;
- a driver information control portion;
- an energy management control portion;
- a brake system control portion;
- an engine start/stop control portion;
- a torque estimation control portion; and

wherein each control portion may be removed from the controller without disrupting operations of the other control portions.